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SYNTHESIS OF 1,3-DIARYL SUBSTITUTED NAPHTHALENES

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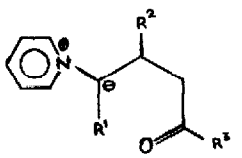
Our interest[1,2] on the versatile ability of onyl pyridinium intermediates (1), formed from the nucleophilic attack of pyridinium ylide carbanion on the β-carbon atom of α,β-unsaturated carbonyl systems, to undergo cyclization in presence of ammonium acetate and acetic acid tempted us to investigate the reaction of p-nitrophenylmethylenepyridinium ylide (2) with α,β-unsaturated ketones in the presence of anhydrous zinc chloride, in order to examine the fate of reaction products.



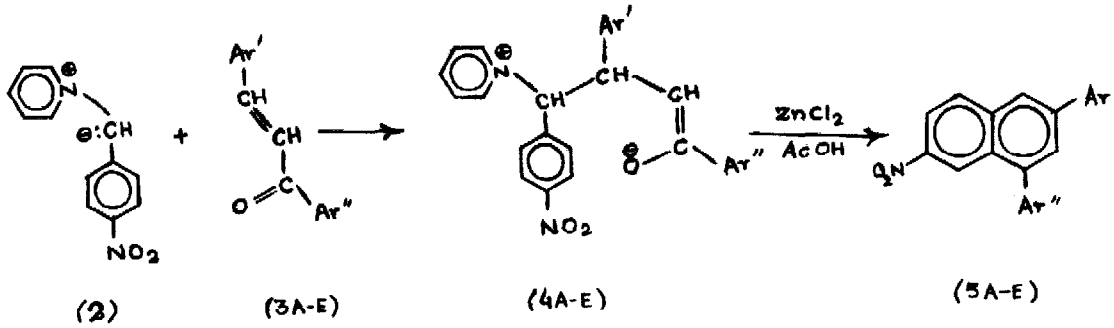
(1)

When ylide (2)[3] was reacted with 4'-chlorobenzylidene-4-methoxyacetophenone (3A) in the presence of anhydrous zinc chloride and glacial acetic acid at reflux temperature, a smooth reaction took place and the new 1-(4-methoxyphenyl)-3-(4-chlorophenyl)-7-nitronaphthalene (5A), m.p. 122°C, was obtained in good yield. The course of the reaction is illustrated in Scheme I.

Likewise were obtained 1-(4-methylphenyl)-3-(4-chlorophenyl)-7-nitronaphthalene (5B), m.p. 145°C, 1-benzylidene-3-phenyl-7-nitronaphthalene (5C), m.p. 160°, 1-(1-naphthyl)-3-(2,4-dimethoxy-5-bromophenyl)-7-nitronaphthalene (5D), m.p. 175° and 1-(2-thiophene)-3-(3,4-methylenedioxyphenyl)-7-nitronaphthalene (5E), m.p. 120°, in fair yields[4] by the reaction of ylide (2) with appropriate α,β -unsaturated carbonyl compounds (3B-E).

The reaction appears to proceed via the intermediacy of betaine type of compound (4) which then undergoes cyclization in the presence of anhydrous zinc chloride to afford 1,3-diaryl-substituted naphthalenes (5A-5E).

SCHEME I



(2) (3A-E) (4A-E) (5A-E)

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2. P. S. Kendurkar and R. S. Tewari, J. Chem. Engg. Data, 19, 184 (1974).

3. The Ylide (2) was generated 'in situ' from p-nitrobenzylpyridinium bromide by dry sodium methoxide at room temperature.

4. Satisfactory microanalytical and spectroscopic data were obtained for compounds 5A-E.